



The Solutions Network

Rochester, New York

29 Palms Co-generation Project

Gary Morrisett
Energy Manager
29 Palms Marine Corps Base

ESPC vs UESC



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|--|---|
| •ESPC | •UESC |
| •Risk assesment | •Risk assesment |
| – Mainly contractor | – Mainly Govt |
| – Long time service arrangement R&R | – No guarentee savings based on estimates |
| – Guarentee savings with M&V | – No service |
| – Contractor involvement through life of project | |

7.2 MW Cogeneration Plant



- Total project cost \$16 m
- Payback 3.5 years
- Applied project payback 19 years
- Completion of plant July 7, 2003
- Annual Yearly Savings - \$5.8 m
- BTU output 35Mbtu

www.energy2004.ee.doe.gov

Plant Basics



- Basic Plant design
 - 7.2 MW Solar Turbine Taurus 60
 - Absorption chilling pre cooling
 - Gas compressors
 - SEMS monitoring and emissions controls
 - Heat rejection system
 - Breaker tie in
 - Central Heat Plant loading

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Design Basics



- Size is dependent on
 - Electrical load-Base loaded
 - Minimum load 7.1MW
 - Thermal load-Maximized- minimal use of heat rejection system, tie into existing Central Heat Plant. Utilize Absorption chillers.
 - 35 Million btu/hr
 - Natural Gas supply-Gas compression

Absorption chilling



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|---|---|
| •Benefit | •Problems |
| •Pre cool air to turbine to increase efficiency | •No backup pump |
| •Utilize waste heat | •Because of ambient temp, cannot fire turbine without chiller unless outside air is cool enough for low T-5 |
| | •No backup method to cool |

Gas compressors



- Benefits
 - 3 compressors
 - Low capacity does not equal shutdown
- Problems
 - Requires constant power
 - Loss of power requires purge of system
 - Single screen control

SEMS monitoring and emissions controls



- Benefits
 - Tighter controls normal less than 1ppm nox
 - Single catalyst design
- Problems
 - Cal gas and calibration requirements AQMD
 - Catalyst replacement every 5 years
 - Amonia Hydroxide solution for control
 - Pump seals

Breaker tie in



- Benefit
- Carry central load of base during extended outages
- Accurate monitoring of loads
- Problems
- Turbine loading sequence
- Complexity of interaction to ring-buss

System performance



- First year complete
- Generated 65 million KWH so far
- Average 7 MW output
- Down time minimal
- Addition of Heat rejection wall to stop hot air from entering turbine
- Complex requirements for electronics and system operations
- Specialized personnel needed to troubleshoot some problems